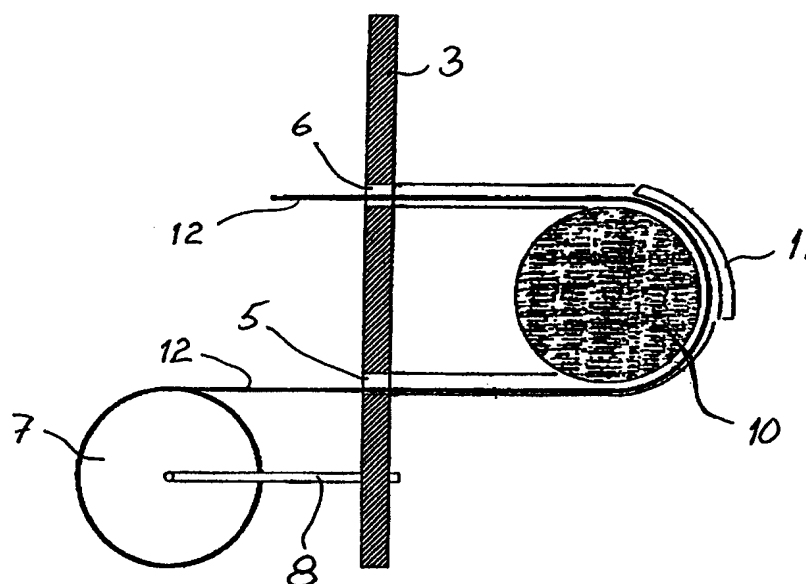




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(54) Title: A PRINTOUT ARRANGEMENT



(57) Abstract

An arrangement for printing out data stored in a vehicle mounted recording device with the aid of a printer provided in said device. The arrangement includes an infeed opening (5) for the infeed of a paper web (12), and outfeed opening (6) for the outfeed of the paper web, and means (10) for leading the paper web from the infeed opening (5), past the printer (11) and from there to the outfeed opening (6).

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A PRINTOUT ARRANGEMENT

The present invention relates to a printout arrangement intended preferably for use in commercial traffic vehicles.

5

There has long been a requirement to record the driving details of commercial traffic vehicles. This requirement relates primarily to the speed of the vehicle at each moment in time and also to the vehicle driving time. There has long
10 been used to these ends a so-called tachograph printer with which a printer needle records the vehicle speed on paper at each moment in time, and with which information relating to the driver or drivers of the vehicle, driver 1 or driver 2, is also recorded.

15

The advent of digital technology has made it much easier to record data relating to the driving details of a vehicle, and the authorities require such registration to be made without the possibility of a driver being able to manipulate the
20 printouts from the recording device. The tachograph is also required to store the information concerned for at least one year and also to enable said information to be retrieved from the tachograph directly for control purposes.

25

With present-day technology, there is no difficulty in retrieving data from such digital recording devices, tachographs, with which data relating to speed, time, respective driver working times, the distances driven, etc., can be stored in the electronic memory of the tachograph.

30

The remaining problem resides in how a printout of the data and information stored in the electronic memory can be achieved in a simple fashion. The use of a separate printer

that is coupled to the tachograph can create problems, because the driver must always have the printer on hand in the vehicle. A preferred solution would be to incorporate the printer in the tachograph. However, the printer must then be
5 constructed to take-up very little space, since it is necessary to be able to place the tachograph at a readily accessible and easily seen position in the vehicle. A suitable place for mounting the tachograph is in a so called radio compartment in the dashboard of the vehicle. This means that the
10 space available for a printer incorporated in the tachograph would be very restricted.

The most practical solution with respect to this type of printer is then the use of a so-called thermoprinter, i.e. a
15 printer that prints on heat-sensitive paper. The quality of the print on a printout on heat-sensitive paper will depend on the ambient temperature among other things, and consequently there has been made available such heat-sensitive papers that have different degrees of heat sensitivity. However, a heat-sensitive paper can be subjected to extreme
20 variations in temperature in a vehicle, where the temperature may vary from -40°C to $+85^{\circ}\text{C}$. When the printer is placed in the dashboard, as mentioned above, a heat-sensitive paper will also be heated by the actual tachograph itself and also
25 by nearby electronic units in addition to said temperature variations in the driver's cabin/vehicle interior, meaning that the temperature within the tachograph will mostly be relatively high. This will result in blackening of the heat-sensitive paper, particularly when the paper is stored in the
30 tachograph for a long period of time.

Accordingly, the object of the present invention is to provide a printout arrangement for a recording device, a tachograph.

graph, with which in particular the aforesaid problems relating to the use of heat-sensitive paper for printing out data from the recording device can be avoided.

5 A further object of the invention is to provide an arrangement which enables data stored in the recording device to be printed out without needing to open the device in order to refill the printer when the paper runs out.

10 These objects are achieved with the present invention by virtue of the invention having the characteristic features set forth in the accompanying Claims.

The objects of the invention are achieved with an arrangement
15 for printing out data stored in a vehicle mounted recording device, said arrangement including a paper web infeed opening, a paper web outfeed opening, and means for leading the paper web from the infeed opening to the outfeed opening via an intermediate printer.

20

The invention will now be described with reference to a non-limiting embodiment thereof illustrated in the accompanying drawings, in which **Fig. 1** is a schematic front view of a recording device provided with a printout arrangement according to the invention; **Fig. 2** illustrates schematically and in
25 larger scale that part of the recording device that includes said paper web infeed and outfeed openings; and **Fig. 3** is a schematic cross-sectional view through the front of the recording device at the location of the printer and the paper
30 web infeed and outfeed openings.

Fig. 1 is a front view of a recording device, a tachograph, in accordance with the invention. The nature of the informa-

tion or data recorded in the tachograph and the manner in which this information or data is recorded is unimportant with respect to the present invention. However, the front panel of the tachograph will preferably include buttons for registering at least two different drivers and also for recording their activities, such as rest periods, driving periods, etc. The illustrated front panel 3 of Fig. 1 includes two separate rows of buttons for two different drivers, the upper row comprising buttons 1a, 1b and 1c for driver 1, and the bottom row comprising corresponding buttons 2a, 2b and 2c for driver 2. The panel also includes an indicating lamp above each activity button, for showing the activity concerned.

Shown on the right of the front panel 3 is the visible part of the printing function of the tachograph, namely buttons 4a, 4b, 4c for controlling the printing function of the printer, and the printing paper infeed opening 5 and outfeed opening 6.

20

Fig. 2 illustrates the infeed opening 5 and the outfeed opening 6 in larger scale, and also shows a roll of paper 7 suspended on a holder 8 beneath the infeed opening. The holder 8 may suitably be L-shaped with the stem of the L protruding in through the front panel 3 of the tachograph, with the paper roll 7 supported on the other part of the holder 8 disposed generally parallel with the front panel 3 and the infeed opening 5. The holder 8 may suitably be constructed so as to enable its stem to be inserted into the tachograph when no paper roll is mounted on the holder, and the other part of the holder can then lie against the front panel 3 or in a recessed part of the panel. When the holder is withdrawn, said other part of the holder will be spaced from the front

panel 3 and therewith enable a paper roll 7 to be pushed onto this part of the holder 8 from its free end.

5 The infeed opening 5 and the outfeed opening 6 in the front panel are interconnected by a passageway 9 which extends through the interior of the tachograph, as will be seen more clearly from the cross-sectional view in Fig. 3. The passageway 9 forms a closed path through the interior of the tachograph and functions to lead the paper web 12 horizontally
10 from the infeed opening to a feed cylinder 10 which is adapted to feed the paper web 12 through the passageway and past the printer 11 mounted in the interior of the tachograph, and from there through the passageway 9 to the outfeed opening 6, where the paper web 12 exits from the tachograph
15 and is thus available to the person who has asked for a data printout from the tachograph memory.

The printer 11 may suitably be a so called thermoprinter which prints on heat-sensitive paper, although the invention
20 is not limited solely to this type of printer but can also be applied with other types of existing printers or future printers.

When wishing to print out data from the tachograph, a roll 7
25 of printing paper is placed on said other part of the holder 8 and the free end of the paper roll 7 is inserted through the infeed opening 5 and up to the feed cylinder 10. The feed cylinder can be activated either by manipulating one of the printer function buttons 4, or the feed cylinder may be de-
30 signed to automatically advance the paper web 12 as soon as the paper web touches the feed cylinder 10. In order to ensure that the paper web feed will be continuous and as smooth as possible, the passageway 9 will preferably have a width

which only slightly exceeds the width of the paper web 12.
When a printout has been completed, the remainder of the
paper roll 7 is removed from the holder 8 and stored in a
place where it will not be damaged and from where it can be
5 used again when needed.

The inventive design of the tachograph and its printout func-
tion in accordance with the invention enables the entire
print function to be encapsulated and sealed in the tacho-
10 graph, so that the tachograph need not be interfered with in
normal use and therewith considerably reduce the possibility
of manipulating the printouts.

CLAIMS

1. An arrangement for printing out data stored in a vehicle-mounted recording device with the aid of a printer provided in said device, **characterised** in that the arrangement includes a paper web (12) infeed opening (5), a paper web (12) outfeed opening (6), and means (10) for leading the paper web (12) from the infeed opening (5), past the printer (11) and to the outfeed opening (6).
2. An arrangement according to Claim 1, **characterised** in that the paper web (12) guiding means is a passageway (9) that includes openings for the printer (11) and feed means (10).
3. An arrangement according to Claim 1 or 2, **characterised** in that the feed means is a feed cylinder (10) that functions to draw-in the paper web (12) and to lead said paper web past the printer (11) and feed said paper web out through the outfeed opening (6).
4. An arrangement according to any one of the preceding Claims, **characterised** in that the infeed opening (5) and the outfeed opening (6) are located in a front panel (3) of said arrangement, said front panel being intended to be mounted in the instrument panel of a vehicle, for instance.
5. An arrangement according to any one of the preceding Claims, **characterised** in that the printer (11) is a thermo-printer.
6. An arrangement according to any one of the preceding Claims, **characterised** in that the arrangement further in-

cludes a holder (8) for supporting a paper roll (7) in the proximity of the infeed opening (5).

7. An arrangement according to Claim 6, **characterised**
5 in that the holder (8) has an L-shape, and in that the stem of the L can be inserted into said arrangement.

8. An arrangement according to Claims 4 and 7, **characterised**
10 in that when inserted, the free end of the holder (8) is accommodated in a recessed part of the front panel (3).

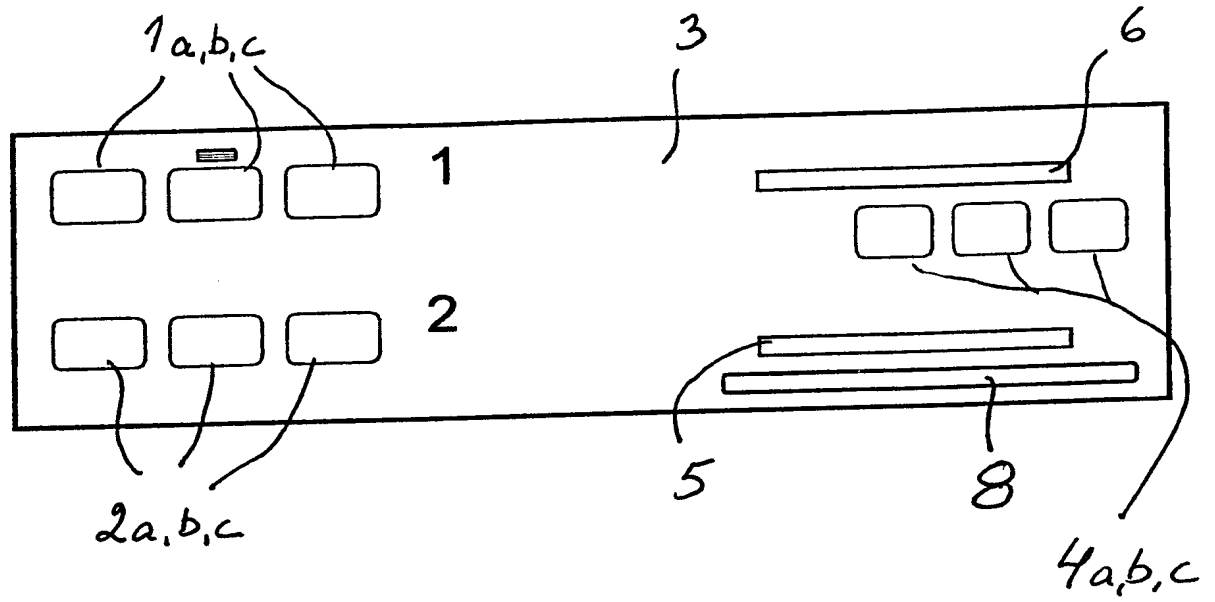


Fig. 1

2/2

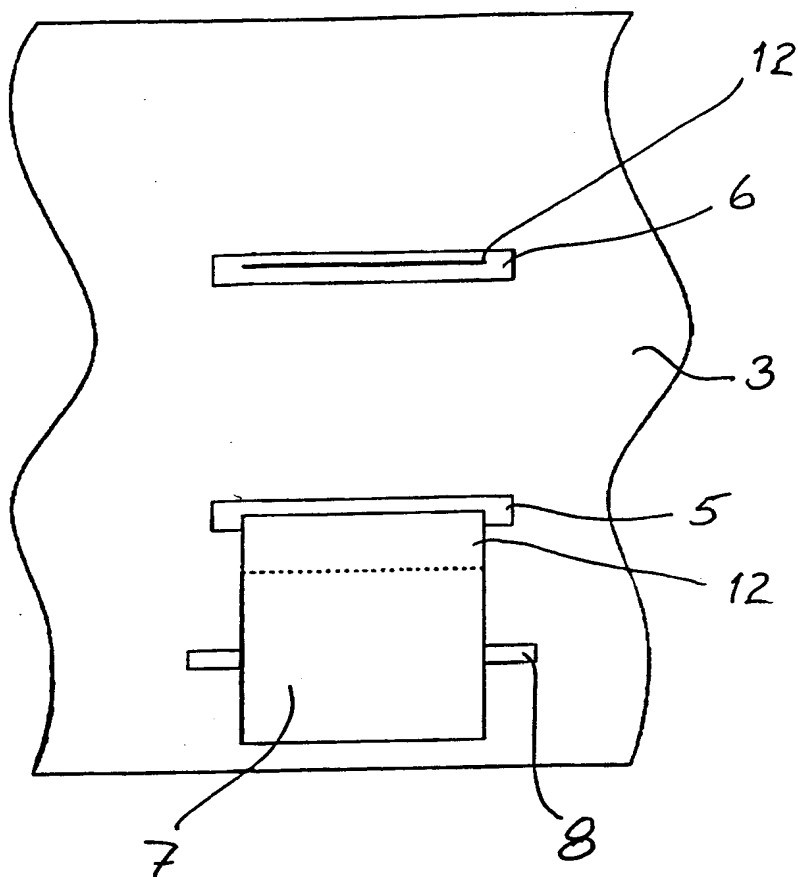


Fig. 2

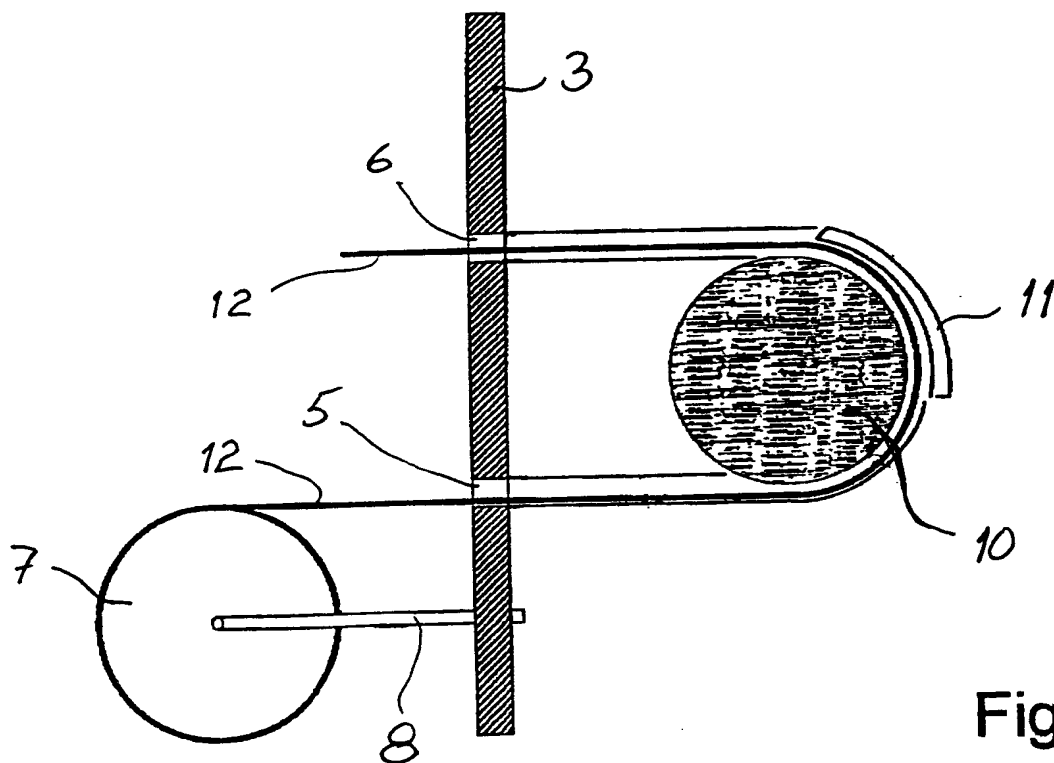


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/01867

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G07B 13/02, G07C 5/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G07B, G07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 29720521 U1 (MANNESMANN VDO AG), 25 June 1998 (25.06.98), page 5, line 26 - line 28, figure 2 --	1-8
A	EP 0342407 A1 (MANNESMANN KIENZLE GMBH), 23 November 1989 (23.11.89), figure 2, abstract -- -----	1-8

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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9 February 2000

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INTERNATIONAL SEARCH REPORT
Information on patent family members

02/12/99

International application No.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29720521 U1	25/06/98	CZ 9803746 A EP 0918222 A JP 11283064 A PL 329496 A	11/08/99 26/05/99 15/10/99 24/05/99
EP 0342407 A1	23/11/89	DE 5890157 A DE 8805789 U JP 2016692 A JP 2564003 B	09/07/92 14/07/88 19/01/90 18/12/96